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Optimal local content requirement policies for extractive industries

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ABSTRACT

Local content requirement policies typically call for a foreign investor to source a portion of its procurements from local suppliers in the domestic economy. Local content requirement policies have long been studied for various industries, and there is currently a vibrant debate on their design or implementation in extractive industries, such as minerals, oil, or gas, especially in resource-rich low-income countries. Our objective in this paper is to characterise optimal local content requirement policies in the context of extractive industries. If an optimal local content requirement policy serves to monetise the positive externalities from foreign investment, then it is, in essence, a Pigouvian subsidy, which is a first-best policy, but the incremental volume of business which it may induce is a function not only of the size of the positive externalities but also of the response of local suppliers to new business opportunities. We discuss four implications: providing high-powered incentives for investor compliance, harvesting the investor's superior information, managing the host government's administrative burden, and mitigating the risk of infantilising local suppliers.

1. Introduction

Extractive industries, such as minerals, oil, or gas, could fuel economic development in resource-rich low-income countries. One popular development strategy is to establish a local content requirement ("LCR") policy calling for a foreign investor to source a portion of its procurements from local suppliers in the domestic economy. LCR policies have long been studied for various industries (Grossman, 1981), and there is currently a vibrant debate on their design or implementation in extractive industries, especially in resource-rich low-income countries (Venables, 2016; Marcel et al., 2016; Bastida 2014; Adedeji et al., 2016; Ovadia 2016; Nwapi 2015; Morris et al., 2012; Haddow 2014; Sutton 2014; Hanlin and Hanlin 2012; Hunter 2014; Tordo et al., 2013; Ramdoo 2015; Kaiser 2014; Bloch and Owusu 2012; Kolstad and Kinyondo 2015; Hufbauer et al., 2013; Adewuyi and Oyejide 2012; Östensson 2014; Winkler 2014; Fessehaie 2012). Although sub-optimal LCR policies in extractive industries, as we discuss further below, likely have adverse economic consequences, the fundamental elements of optimal design or implementation seem to be poorly understood. Indeed Tordo et al. (2013) claims that much of LCR policy analysis in the oil and gas sector has been qualitative.

Our contribution to the debate is to characterise optimal LCR policies in the context of extractive industries. We have a distinctive approach to the modelling. Foreign investment potentially brings positive externalities to the domestic economy, such as new skills, the leverage of foreign capital, or local linkages. If an optimal LCR policy serves to monetise the positive externalities of foreign investment, then it is, in essence, a Pigouvian subsidy, which is a first-best policy. It follows that the concept of an optimal LCR policy, represented in the modelling as an optimal subsidy, arises from the maximisation of incremental economic welfare consisting of the policy cost, the incremental producer surplus enjoyed by local supply, and the social benefit arising from additional local supply above the natural level prevailing in the absence of an LCR policy. In other words, depending on the circumstances, there is a natural level of local content due to the innate competitiveness of local suppliers without an LCR policy, and there is an efficient level of local content due to optimal LCR policy.

However, the incremental volume of business which an optimal LCR policy may efficiently induce is a function of both the size of the positive externalities and the response of local suppliers to new business opportunities. The size of the positive externalities depends on the gap between the private values and social opportunity costs of labour or capital. The response of local suppliers to new business opportunities is contingent on their competitiveness. We posit in our model that local supply for an input required by the investor uses labour and capital under a decreasing returns-to-scale Cobb-Douglas technology which facilitates the representation not only of the gap between private values and social opportunity costs of labour and capital, but also of the potentially limited capability of local suppliers to respond to market signals. We demonstrate that the interaction between the size of the positive externalities and the capability of local suppliers has profound effects on optimal LCR policy.

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We discuss four implications for LCR policy. One is the high-powered incentives for investor compliance. The investor procures a higher quantity of local supply, and incurs a higher procurement cost, with the LCR policy than without it. In short, typically there is a policy cost. We propose that, although the policy cost is typically borne by the investor, it is ultimately shouldered by the government through a reduction in the royalty paid on the resource, as long as there is compliance. In other words, the investor, enjoying a royalty break if it complies with the LCR policy, is compensated for the policy cost it incurs. However, we further propose that, in the event of non-compliance, the government imposes a penalty equal to the foregone economic benefits comprising not only the incremental producer surplus which would have been enjoyed by local suppliers, but also the social benefit which would have been generated by additional local supply above the natural level without the LCR policy. Inasmuch as the compliance cost, if the royalty break is properly estimated, is nil, even a small amount of foregone economic benefits is sufficient to cause a positive cost of non-compliance. As a consequence, the cost of compliance is likely lower than that of non-compliance, and the sensible course of action for the investor is to comply.

Another implication for LCR policy is the harvesting of the superior information of the investor. An investor in extractive activities obviously has limited flexibility on its production location decision and thus is generally unable to engage in spatial cost arbitrage pitting production cost in one location against that in another. Thus, pretty much immobile, the investor located on-site is likely motivated to search diligently for cost saving opportunities wherever they could be found. As we discuss above, the royalty break, which is the compensation to the investor for the policy cost, is an estimate of the extra procurement cost incurred under an LCR policy. If the investor, relying on its deep knowledge and expertise, finds local suppliers which, at the appropriate quality, are willing and able to deliver at very low cost, then it may be able to reduce its actual extra procurement cost, and pocket the difference. We argue that the opportunity to secure cost savings until the LCR policy is adjusted over the policy cycle, akin to a process under price cap regulation, provides an incentive for the investor to search for the best-performing local suppliers. This virtuous process, in turn, encourages local suppliers to be as competitive as possible and enhances the prospects for strengthening local linkages.

A third implication for LCR policy is the management of the administrative burden on the host government. We assert that an optimal LCR policy minimises the risk, not uncommon amongst resource-rich low-income countries, of government mismanagement or corruption. Under an optimal LCR policy, the incentives for compliance or non-compliance are not only based on economically sound principles (rather than on arbitrary edicts), but also verifiable by a third-party, such as a judge, jury, or arbitrator, in the event of a dispute. As a result, the audit of policy benefits or costs is facilitated, and the scope for bureaucratic discretion is restricted, both of which are especially important if governance capacity in the host economy happens to be low. Moreover, the economic benefits of policy are delivered directly through the profit-maximising behaviour of an investor "on the ground" rather than indirectly through a possibly conflicted government bureaucracy "far away."

Finally, a fourth implication for LCR policy is the mitigation of the risk of infantilising local suppliers. Under an LCR policy, the maturation of local suppliers, enjoying protection from international competition, may be slow. We claim that the LCR policy cycle serves as a mechanism for monitoring the magnitude or direction of the performance of local suppliers. If local capability improves over time, the local supply curve is likely to shift out, indicating an increase in competitiveness, and the result is a higher quantity available at any given price. However, if, over the policy cycle, the local supply curve has not shifted out or is slow to shift out, there is an economically sound (rather than arbitrary) basis for changing or terminating the LCR policy. In other words, if the investor, after several LCR policy cycles, repeatedly finds uncompetitive sectors chronically unwilling or unable to respond to new business opportunities, then the government receives a clear market signal to alter or end policy support.

Our approach is to deploy a high level of generality and abstraction in order to isolate the fundamental elements of the incentive problem and to support their application to a wide range of settings. The rest of this paper is structured as follows. Section 2 reviews the principles underlying LCR policies in extractive industries. Section 3 describes the optimisation model and the calibration. Section 4 draws implications for the design or implementation of LCR policy. Section 5 offers a conclusion and identifies areas for further research.

2. Local content requirement policies in extractive industries

It is not immediately obvious that extractive industries could be catalysts for economic development in resource-rich low-income countries. Extractive industries are highly capital intensive, and their spill-overs, such as linkages beyond enclaves, tend to be limited (Kaiser, 2014; Boadway and Keen 2010). Their employment impact, especially upstream, is modest and relatively low-skilled (Kaiser, 2014; McMillan and Rodrik 2011; Boadway and Keen 2010). In fact, it seems very difficult to rely on extractive industries for economic development. Venables (2016) narrates that, although harnessing extractive industries for development sounds straightforward, it is not easy at all, for various reasons, such as the intense pressure for current spending, the damage to other tradable sectors of an exchange rate appreciation due to resource exports (the so-called "Dutch disease" effect), a disproportionate dependence on a lone volatile source of income, weak governance, or political forces prompted by the potential for resource wealth. Indeed Venables (2016) reports that few developing economies have succeeded in doing so, and that "... economic growth has generally been lower in resource-rich developing countries than in those without resources." McMillan and Rodrik (2011), providing evidence for China, India, other Asian countries, Latin America, and sub-Saharan Africa, shows that the larger the share of natural resources in exports, the smaller the scope for productivity-enhancing structural change. Conducting a scholarly synthesis of a vast literature, Venables (2016) concludes that "... no single answer can be given to the question of why it has proven so difficult to harness natural resource wealth for broader economic development."

Another way of looking at the matter is to identify mechanisms for enhancing the value captured from extractive industries. The fiscal regime obviously plays a crucial role. Boadway and Keen (2010) expounds on the characteristics of the resource sector. Given the prevalence of foreign ownership and the magnitude of tax receipts, tax revenue is likely to be the core benefit to the host country. There are high sunk costs and long production periods. Hundreds of millions of dollars could be spent over decades. In mining, it is not uncommon for 50 years to elapse between exploration and rehabilitation. Expenses are incurred early in the life of the project, often prior to the generation of cash flow, and then are sunk, with little if any alternative use. While the resource project is in the design stage, the prospective tax base is highly sensitive to the anticipated tax regime, but once sunk costs have been incurred, investors have little choice. As long as they can cover variable costs, producing is more profitable than ceasing operations and the tax base becomes relatively insensitive to tax design.

There are, of course, other mechanisms for increasing value capture, such as harvesting the benefits from local economic linkages across the value chain. Rodríguez-Clare (1996) provides a discussion of the positive externalities arising from backward and forward linkages. A final-good firm increases the demand for inputs and induces a widening variety of specialised inputs. This backward linkage represents a positive externality to other final-good producers. The local production of increasing amounts of specialised inputs allows the competitive production of increasingly complex goods which intensively use specialised inputs. This forward linkage represents a positive